

CLAIMS

1. An image signal generation unit (10) comprising:
 - a horizontal pixel number conversion means (12, 14) for converting
5 horizontal pixel number of a digital image data to a number, or half the number, suitable for generation of video signals for first television system; and
 - a first output means (14) for digitally outputting the digital image data with the horizontal pixel number converted by the horizontal pixel number conversion means (12,14) to a driving circuit (19a) of a display panel (19, 19');
10 characterized in that a horizontal pixel number of the display panel (19, 19') is approximately equal to the horizontal pixel number, or half the number thereof, suitable for the generation of the video signals for the first television system.
2. An image signal generation unit (10) according to claim 1 characterized in that,
15 the horizontal pixel number suitable for the generation of the video signals for the first television system is 704 pixels or 1408 pixels, and the horizontal pixel number conversion means (12, 14) converts horizontal pixel number of digital image data into 352 pixels, 704 pixels or 1408 pixels, and
the horizontal pixel number of the display panel (19, 19') is approximately
20 equal to 352 pixels, 704 pixels or 1408 pixels.
3. An image signal generation unit (10) according to claim 1, characterized in that video signals of the first television system are NTSC (National Television Systems Committee) signals.
4. An image signal generation unit (10) according to claim 1 characterized
25 by further comprising:
 - a first generation means (13, 13') for generating digital video signals compliant with the first television system from digital image data whose horizontal

pixel number is converted into the horizontal pixel number suitable for the generation of video signals for the first television system by the horizontal pixel number conversion means (12, 14); and

a second output means (17) for outputting video signals generated by the first
5 generation means (13).

5. An image signal generation unit (10) according to claim 4 characterized by further comprising a conversion means (52) for converting digital image data suitable for the generation of the video signal of second television system, from digital image data whose horizontal pixel number is converted into a horizontal pixel
10 number suitable for the generation of video signals for the first television system, by the horizontal pixel number conversion means (12, 14), and

characterized in that the first generation means (13, 13') includes a means (13') for generating digital video signals compliant with the second television system from the digital image data suitable for generating video signals for the second
15 television system converted by the conversion means (52).

6. An image signal generation unit (10) according to claim 5 characterized in that the video signals for the second television system are PAL (Phase Alternating Line) signals.

7. An image signal generation unit (10) according to claim 1 characterized
20 by further comprising a second generation means (14) for generating a digital RGB code signal from digital image data with the horizontal pixel number converted by the horizontal pixel number conversion means (12, 14), and

characterized in that the first output means (14) digitally outputs digital RGB code signals generated by the second generation means (14) in the driving circuit
25 (19a) of the display panel (19, 19').

8. An image signal generation unit (10) according to claim 1 characterized in that

the horizontal pixel number conversion means (12, 14) includes: a first horizontal pixel number conversion means (12) for converting horizontal pixel numbers of digital image data into horizontal pixel numbers suitable for the generation of video signals for the first television system, and a second horizontal pixel number conversion means (14) for converting horizontal pixel numbers of digital image data with the horizontal pixel numbers converted by the first horizontal pixel number conversion means (12), into half the horizontal pixel numbers, and

the first output means (14) digitally outputs digital image data with the horizontal pixel number converted by the second horizontal pixel number conversion means (14), into the driving circuit (19a) of the display panel (19, 19').

9. An image signal generation unit (10) according to claim 8 characterized by further comprising a second generation means (14) for generating digital RGB code signals from digital image data with the horizontal pixel number converted by the first horizontal pixel number conversion means (12), and

characterized in that the second horizontal pixel number conversion means (14) converts horizontal pixel number of the digital RGB code signal generated by the second generation means (14) into half the horizontal pixel number.

10. An image signal generation unit (10) according to claim 8 characterized in that

the display panel (19, 19') has a delta array in which 3 color elements forming one pixel is arranged in a triangle shape that spans 2 lines, and number of the signal electrode is a half of one line of the horizontal pixel number outputted by the first horizontal pixel number conversion means (12) after conversion, and

the first horizontal pixel number conversion means (12) thinning the elements so that the same color elements neighboring each other in corresponding 2 lines in the digital image data with the horizontal pixel number converted by the first horizontal pixel number conversion means (12) are displaced by 1.5 pixel from each

other, thereby converting the number of horizontal pixel to a half thereof.

11. An image signal generation unit (10) according to claim 8 characterized by further comprising:

a video memory (11, 11') for supplying digital image data to the horizontal pixel
5 number conversion means (12, 14); and

a switching and selecting means (21) for switching and selecting either an output from the video memory (11, 11') or an output from the first horizontal pixel number conversion means (12); and

characterized in that the output of video memory (11, 11') or the output of the
10 first horizontal pixel number conversion means (12) switched and selected by the switching and selecting means (21), is supplied to the second horizontal pixel number conversion means (14).

12. An image signal generation unit (10) according to claim 1 characterized by further comprising a video memory (11, 11') for supplying digital image data to
15 the horizontal pixel number conversion means (12, 14).

13. An image signal generation unit (10) according to claim 12 characterized by further comprising a switching and selecting means (21) for switching and selecting either an output of the video memory (11, 11') or an output of the horizontal pixel number conversion means (12, 14), and

20 characterized in the first output means (14) digitally outputs either the output of horizontal pixel number conversion means (12, 14) or the output of video memory (11, 11') switched and selected by the switching and selecting means (21) to the driving circuit (19a) of the display panel (19, 19').

14. An image signal generation unit (10) according to claim 13 characterized
25 by further comprising third horizontal pixel number conversion means (51) for converting horizontal pixel number of digital image data supplied by the video memory (11, 11'), and

characterized in that the switching and selecting means (21) switches and selects either output of third horizontal pixel number conversion means (51) or output of the horizontal pixel number conversion means (12, 14), and

the first output means (14) digitally outputs the output of third horizontal pixel
 5 number conversion means (51) or the output of horizontal pixel number conversion means (12, 14) switched and selected by the switching and selecting means (21), to the driving circuit (19a) of the display panel (19, 19').

15. An image signal generation unit (10) according to claim 1 characterized in that,

10 the horizontal pixel number conversion means (12, 14) further includes a means for converting the horizontal pixel number of digital image data into a predetermined horizontal pixel number other than the number, or half the number, of horizontal pixel suitable for the generation of video signals for the first television system, and

the display panel (19, 19') further includes a display panel of the predetermined
 15 horizontal pixel number.

16. An image signal generation unit (10) according to claim 1 characterized in that the first output means (14) includes a means for converting digital image data of primary color in parallel structure into serial data, and digitally outputting them to the driving circuit (19a) of the display panel (19, 19').

20 17. An image signal generation unit (10) comprising:

a video memory (11) providing digital image data,

a first output means (14) which digitally outputs the digital image data provided by the video memory (11), to a driving circuit (19a) of a display panel (19),

a first horizontal pixel number conversion means (12) to convert a horizontal pixel
 25 number of digital image data supplied by the video memory (11), to a horizontal pixel number suitable for generation of video signals for first television system,

a first generation means (13) for generating digital video signals compliant with

the first television system from digital image data with the horizontal pixel number converted by the first horizontal pixel number conversion means (12), and

a second output means (17) outputting video signals generated by the first generation means (13).

5 18. An image signal generation unit (10) according to claim 17 characterized in that

the horizontal pixel numbers of the horizontal pixel number suitable for generating the video signals for the first television system are 704 pixels or 1408 pixels, and

10 the first horizontal pixel number conversion means (12) converts horizontal pixel number of digital image data into 704 pixels or 1408 pixels.

19. An image signal generation unit (10) according to claim 17 characterized by further comprising a second generation means (14) for generating digital RGB code signals from the digital image data supplied by the video memory (11), and

15 characterized in that the first output means (14) digitally outputs the digital RGB code signal generated by the second generation means (14), to the driving circuit (19a) of the display panel (19) .

20. An image signal generation unit (10) according to claim 17 further comprising a second horizontal pixel number conversion means (51) for converting horizontal pixel numbers of digital image data supplied by the video memory (11),

20 characterized in that the first output means (14) digitally outputs the digital image data with the pixel number converted by the second horizontal pixel number conversion means (14), to the driving circuit (19a) of the display panel (19).

21. An image signal generation unit (10) according to claim 20 characterized in that,

25 the horizontal pixel numbers of digital image data supplied by the video memory (11) is 320 pixels,

the second horizontal pixel number conversion means (51) converts the

horizontal pixel number of digital image data into 480 pixels, and

a horizontal pixel number of the display panel (19) is approximately equal to 480 pixels.

22. An image signal generation unit (10) according to claim 17 characterized
5 in that video signals of the first television system are NTSC signals.

23. An image signal generation unit (10) according to claim 17 characterized
by further comprising a conversion means (52) to convert digital image data of
horizontal pixel numbers suitable for the generation of video signals for the first
television system output by the first horizontal pixel number conversion means (12),
10 into digital image data suitable for generation of video signals for second television
system,

characterized in that the first generation means (13) includes a means for
generating digital video signals compliant with the second television system from
digital image data suitable for generating the video signals of the second television
15 system converted by the conversion means (52).

24. An image signal generation unit (10) according to claim 15 characterized
in the first output means (14) converts digital image data of primary color in parallel
structure into serial data and digitally output them to the driving circuit (19a) of the
display panel (19).

20 25. An image signal generation unit (10) comprising:

a horizontal pixel number conversion circuit (12, 14) for converting a digital
image data horizontal pixel number to a number, or half the number, suitable for
generation of video signals for first television system; and

a first output circuit (14) for digitally outputting the digital image data with
25 the horizontal pixel number converted by the horizontal pixel number conversion
circuits (12, 14) in a driving circuit (19a) of a display panel (19, 19');

characterized in that a horizontal pixel number of the display panel (19, 19')

is approximately equal to the horizontal pixel number, or half the number, suitable for the generation of the video signals of the first television system.

26. An image signal generation unit (10) comprising:

a video memory (11) for providing digital image data;

5 a first output circuit (14) for digitally outputting the digital image data provided by the video memory (11) to a driving circuit (19a) of a display panel (19);

a first horizontal pixel number conversion circuit (12) for converting a horizontal pixel number of digital image data supplied by the video memory (11) into a horizontal pixel number suitable for generation of video signals for first television

10 system;

a first generation circuit (13) for generating digital video signals compliant with the first television system from digital image data with the horizontal pixel number converted by the first horizontal pixel number conversion circuit (12); and

a second output circuit (17) for outputting video signals generated by the first
15 generation circuit (13).

27. A digital camera comprising:

imaging means (33, 36, 37) for imaging an object and outputting digital image data;

a horizontal pixel number conversion means (12, 14) for converting a
20 horizontal pixel number of digital image data outputted by the imaging means (33, 36, 37) to a horizontal pixel number, or half the number, suitable for generation of video signals for first television system; and

a first output means (14) for outputting digital image data with horizontal pixel number converted by the horizontal pixel number conversion means (12, 14), in

25 a driving circuit (19a) of a display panel (19, 19');

characterized in that a horizontal pixel number of the display panel (19, 19') is approximately equal to the horizontal pixel number, or half the number, suitable

for the generation of the video signal for the first television system.

28. A digital camera comprising:

imaging means (33, 36, 37) for imaging an object and outputting digital image data;

5 a video memory (11) for storing digital image data output by the imaging means (33, 36, 37);

a first output means (14) for digitally outputting the digital image data supplied by the video memory (11) to a driving circuit (19a) of a display panel (19);

a first horizontal pixel number conversion means (12) for converting
10 horizontal pixel number of digital image data supplied by the video memory (11) into horizontal pixel number suitable for generation of video signals for first television system;

a first generation means (13) for generating a digital video signal compliant with the first television system from digital image data with the horizontal pixel
15 number converted by the first horizontal pixel number conversion means (12), and

a second output means (17) for outputting video signals generated by the first generation means (13).

29. A digital camera comprising:

imaging circuits (33, 36, 37) for imaging an object and outputting digital
20 image data;

a horizontal pixel number conversion circuits (12, 14) for converting horizontal pixel numbers of digital image data output by the imaging circuits (33, 36, 37) to a horizontal pixel number or half the number, suitable for generation of video signals for first television system, and

25 a first output circuit (14) for outputting digital image data with the horizontal pixel number converted by the horizontal pixel number conversion circuits (12, 14) to a driving circuit (19a) of a display panel (19, 19');

characterized in that a horizontal pixel number of the display panel (19, 19') is approximately equal to the horizontal pixel number, or half the number, suitable for the generation of the video signal of the first television system.

30. A digital camera comprising:

5 imaging circuits (33, 36, 37) for imaging an object and outputting digital image data;

 a video memory (11) for storing digital image data outputted by the imaging circuits (33, 36, 37);

10 a first output circuit (14) for digitally outputting the digital image data supplied by the video memory (11) to a driving circuit (19a) of a display panel (19);

 a first horizontal pixel number conversion circuit (12) for converting horizontal pixel number of digital image data supplied by the video memory (11) into horizontal pixel number suitable for generation of video signals for first television system;

15 a first generation circuit (13) for generating digital video signal compliant with the first television system from digital image data with the horizontal pixel number converted by the first horizontal pixel number conversion circuit (12); and

 a second output circuit (14) for outputting video signals generated by the first generation circuit (13).

20 31. An image signal generation method comprising:

 a step (12, 14) of converting horizontal pixel number of digital image data to horizontal pixel number, or half the number, suitable for generation of video signals for first television system; and

25 a step (14) of digitally outputting digital image data with the horizontal pixel number converted, to a driving circuit (19a) of a display panel (19, 19');

 characterized in that a horizontal pixel number of the display panel (19, 19') is approximately equal to the horizontal pixel number, or half the number, suitable for

the generation of video signals for the first television system.

32. An image signal generation method comprising:

a step of storing digital image data in a video memory (11);

5 a step of digitally outputting the digital image data supplied by the video memory (11) to a driving circuit (19a) of a display panel (19);

a step (12) of converting horizontal pixel number of digital image data supplied by the video memory (11) into a horizontal pixel number suitable for generation of video signals for first television system;

10 a step (13) of generating digital video signals compliant with the first television system from digital image data with the horizontal pixel number converted; and

a step (17) of outputting generated video signals.